Force XXI Battle Command Brigade and Below (FBCB2) Past, Present and Future

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In the mid-1990s, when FBCB2 was first fielded, it was still an emerging technology with plenty of room for improvement. It is now undergoing major system redesigns to capitalize on new technologies and incorporate important lessons learned. FBCB2 is fast becoming a Joint program with a new version of software called FBCB2-Joint Capabilities Release (JCR). FBCB2-JCR will vastly improve the system, overcoming many of the previous version's shortfalls. FBCB2-JCR will provide the foundation necessary for the U.S. Army and U.S. Marine Corps (USMC) to converge fully on a single common FBCB2-based system for platform battle command called Joint Battle Command-Platform (JBC-P). JBC-P will meet Joint command and control (C2) and situational awareness (SA) requirements and will include new hardware, dismounted solutions and beacon capabilities. As FBCB2 evolves into FBCB2-JCR and later JBC-P, it will improve and become more user-friendly and capable for the Soldiers who employ it.

Radio transmissions via SINCGARS allow unit commanders to track subordinate platoons on FBCB2 through representative icons on their digital map displays. Here, SGT Rafael Perez from Apache Co., 1-23 Infantry Regiment, 3rd Stryker Brigade Combat Team, 2nd Infantry Division, talks on the radio and pulls security at a courtyard in Ghazaliya, Iraq, during a combined cordon and search with the Iraqi army on March 24, 2007. (U.S. Army photo by SGT Tierney Nowland.)

When FBCB2 was fielded, CPT Michael D. Acord, Commander, Bravo Co., 2nd Battalion, 8th Infantry Regiment, 4th Infantry Division (4ID), heralded it for the capabilities it provided. "I realized its full potential during a night mechanized infantry attack. If you have never been on such an attack, let me paint you a picture. Imagine yourself on top of a loud vehicle moving toward your objective. You navigate using a map and small flashlight. Radios blare in your head. You barely know where you are, much less where your three platoons and associated infantry squads are located," Acord related. "FBCB2 mitigates those conditions. With FBCB2, I could 'see' the locations of all three platoons represented by their icons on my digital map. These icons were real-time position updates being transmitted via radios [Single Channel Ground and Airborne Radio System (SINCGARS) and Enhanced Position Location and Reporting System]. When we made contact, the platoons sent spot reports that posted as icons directly on my map. This aided me in confirming my read of the enemy. The lit map provided a clear picture of the terrain. Line-of-sight analysis allowed me to determine the intervisibility lines and where we would likely make contact with the enemy," he concluded.

Improved Friendly Force Identification

FBCB2 has improved unit SA exponentially. Commanders and leaders have more efficient and effective C2 of their units, and FBCB2 enables them to adapt more quickly than the enemy. In short, it enables battle command. Equally important, FBCB2 has served as an input for combat identification (CID) to inform "engage/don't engage" decisions. Numerous reports from *Operations Enduring* and *Iraqi Freedom* (*OEF/OIF*) indicate that many lives on the battlefield were saved using FBCB2 to help prevent fratricide incidents. (*Editor's Note:* For more information on CID, see the article on Page 34, January-March 2007 *Army AL&T* Magazine or go to **http://asc.army.mil/docs/pubs/alt/current/issue/articles/34_A_Holistic_Approach_to_Combat_Identification _200701.pdf**.)

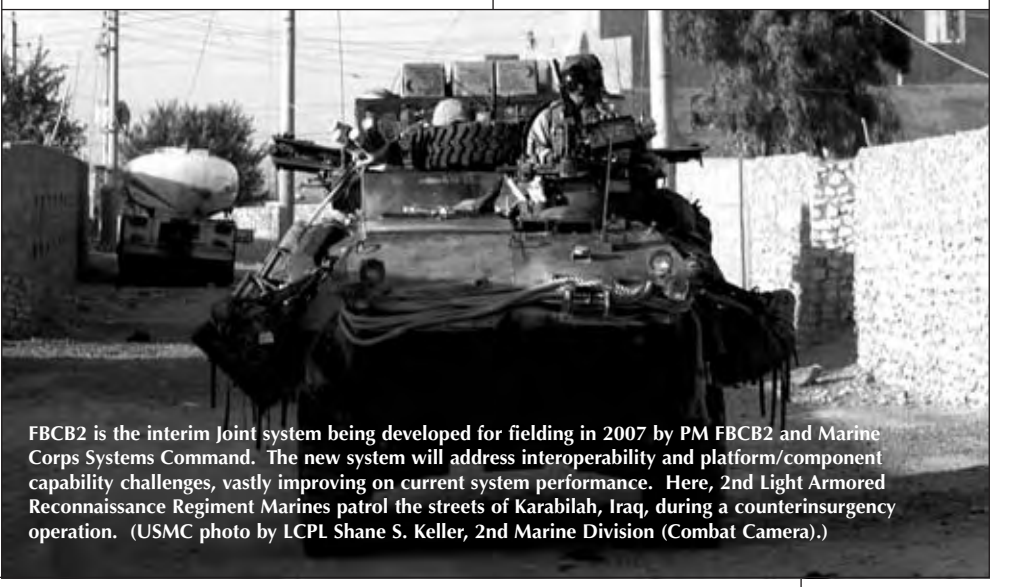
FBCB2 serves as the C2/SA link between platforms and the C2/SA systems located in the operations centers at all levels. On April 7, 2003, during *OIF*, for example, senior leaders at the Pentagon were able to watch in near real-time the 2nd Brigade Combat Team, 3ID, advance as they drove into Baghdad. Never before had such an accurate picture of reality on the ground been available at all levels of command simultaneously. Its significance is summed up by this statement from 3ID's *OIF* After Action Report written in May 2003. "The single most successful C2 system fielded for *OIF* was the FBCB2-Blue Force Tracking (BFT) system. It is important to mention that the FBCB2 system used during this operation was not fielded to facilitate division C2, but rather to facilitate tracking of friendly forces at echelons above division. Even so, BFT gave commanders situational understanding that was unprecedented in any other conflict in history."

> When the system is turned on, the nearest TSG will detect it and begin to act as its server. The vehicle's FBCB2-JCR will transition from TSG to TSG as it moves across the battlefield, providing uninterrupted connectivity.

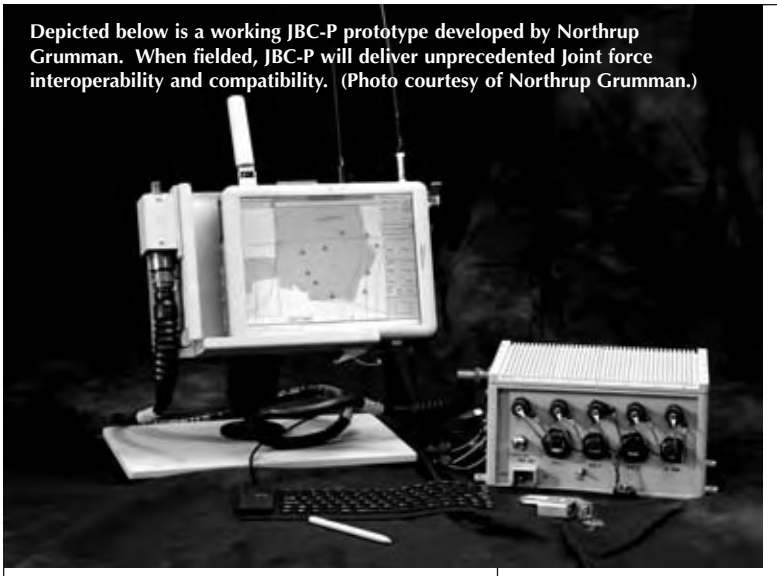
Current System Limitations

Although FBCB2 performed admirably, it has its limitations. A significant limitation learned during recent operations was that many of the numerous, service-specific C2/SA systems are not interoperable. This lack of platform-level interoperability prevents the sharing of vital friendly, enemy and other survivability information, and increases the risk of interservice fratricide.

The Joint Requirements Oversight Council (JROC) recognized the capability gap that incompatible service-specific C2/SA systems presented and, after an exhaustive study, issued *JROC Memorandum (JROCM) 163-04*, which directed that the USMC adopt FBCB2 for both platform and dismounted applications.



FBCB2 is the interim Joint system being developed for fielding in 2007 by PM FBCB2 and Marine Corps Systems Command. The new system will address interoperability and platform/component capability challenges, vastly improving on current system performance. Here, 2nd Light Armored Reconnaissance Regiment Marines patrol the streets of Karabilah, Iraq, during a counterinsurgency operation. (USMC photo by LCPL Shane S. Keller, 2nd Marine Division (Combat Camera).)



Depicted below is a working JBC-P prototype developed by Northrup Grumman. When fielded, JBC-P will deliver unprecedented Joint force interoperability and compatibility. (Photo courtesy of Northrup Grumman.)

As a result of that directive, the Program Manager (PM) FBCB2 began developing an interim Joint system (FBCB2-JCR). In parallel, the U.S. Army Training and Doctrine Command Capability Manager (TCM) for Platform Battle Command and CID began the extensive process of documenting the Joint C2/SA requirements for a new JBC-P system that would meet U.S. Army, USMC, special operations forces and aviation community requirements as well as those of the other various components within the Joint force.

FBCB2-JCR is the interim Joint system under development by PM FBCB2 and Marine Corps Systems Command. Testing began in March 2007 and will address many interoperability gaps identified during *OEF/OIF* combat operations.

Capabilities-Based Improvements

There are three primary development efforts that are part of FBCB2-JCR: network, database and software. FBCB2-JCR will redesign the terrestrial network making it area-based versus hierarchically based. The system will work similar to a cell phone network. With this architecture, platoon leaders are not limited to specific servers within the unit. Rather, their systems will automatically connect to any Tactical Services Gateway (TSG) — similar to a mobile cell phone tower — on the battlefield. When the system is turned on, the nearest TSG will detect it and begin to act as its server. The vehicle's FBCB2-JCR will transition from TSG to TSG as it moves across the battlefield, providing uninterrupted connectivity.

FBCB2-JCR will greatly improve the database process by initially loading only a small, unit-sized and much simplified database on each hard drive. The system would then "learn" the rest of the database as it receives information from other users on the net. FBCB2-JCR will eliminate the need to create a massive database that must be updated and manually copied onto every hard drive.

FBCB2-JCR will rewrite the FBCB2 software making it more modular and reusable. This supports creation of other battle command products that could reuse the core components of FBCB2-JCR software, and add new software components for new product-specific functionality.

Perhaps the most important improvement of all is interoperability. FBCB2-JCR will be fielded to both the Army and USMC during 2007, and will increase compatibility with other C2/SA systems across the Joint force. The Movement Tracking System has incorporated JCR software and will be almost fully interoperable with FBCB2-JCR. This will improve the Common Operational Picture (COP) at all levels, help to reduce the risk of fratricide and better enable real-time battle command.

Family-of-Systems (FoS)

JCR will be followed by a completely new FBCB2 variation called JBC-P. JBC-P greatly improves on FBCB2 and is the Army's and USMC's solution to comply with *JROCM 163-04* and fully converge on an integrated platform level C2/SA system. JBC-P is an FoS that can share C2/SA across the Joint operational environment from various platforms with disparate missions and requirements. The JBC-P product line will consist of the following FoS:

- *JBC-P Full.* This will be the standard computer, screen and software. It will include integrated Global Positioning Systems and will be the same size or smaller than the current FBCB2 V4s. Users will be able to

FBCB2-BFT was the most successful battle command system fielded during *OEF/OIF*. The system provides an unprecedented capability to track friendly forces at echelons above division. Here, Soldiers from 1st Battalion, 68th Armored Regiment, 3rd Heavy Brigade Combat Team, 4th Infantry Division, set up a perimeter after drawing enemy fire during a population patrol operation near Forward Operating Base Warhorse, Iraq, last September. (U.S. Air Force photo by TSGT Michelle A. Desrochers, 4th Combat Camera Squadron.)

remove the screen from its mount and move it to different locations within or around the platform — up to 15 feet away. Select leaders' vehicles will also receive a dismountable personal digital assistant-like product that can dock with the full capability, but when dismounted, can continue to receive and send C2/SA information while the users are a short distance from their platform (up to 300 meters).

- *JBC-P Partial.* The partial capability describes those systems that require a level of interoperability with JBC-P but may not use the same hardware or software to achieve that interoperability. An example of a partial capability system is that designated for rotary-wing aircraft. The aircraft must be able to share C2/SA, but the cockpit environment requires different hardware and simplified user interfaces. Partial also includes a stand-alone hand-held product that will provide C2/SA to dismounted infantry, special operations forces, reconnaissance units and other users who require a man-portable JBC-P version with integrated communications. This capability will integrate dismounted forces into the COP for the first time.
- *JBC-P Beacon.* This is a 1-way beaconing device to populate the COP with Blue (friendly force) position location information tracks for CID purposes. Beacons will be less expensive than Full versions of JBC-P and will be fielded in enough quantities to ensure at least one for every two platforms is sending position reports to the COP. Beacons will also aid in CID with a primary objective of informing "engage/don't engage" decisions and preventing fratricide.

JBC-P will enable warfighters to download and send digital pictures. They will have a free draw "John Madden" type capability and will have enhanced collaboration tools such as chat. Vectors projected on the screen will indicate direction of main gun engagements. JBC-P will highlight and display friendly units in different user selectable colors and sizes on their user-defined COP display. It will store messages that are sent but not received and then resend or forward them when the addressee reenters the net. JBC-P will be able to display "snail trails" or retrace the movement of icons back through time. In short, JBC-P will provide numerous new capabilities that greatly increase the SA of Joint leaders and commanders, and significantly enhance their ability to provide effective C2.

FBCB2 has provided unprecedented SA to all levels of command providing enhanced battle command when and where it was needed most. Next generation JBC-P will build on system success and provide even better situational understanding in the very near future. Here, SPC Jeremy Turner, C Troop, 8th Squadron, 10th Cavalry Regiment, 4th Brigade, 4ID, provides security during a presence patrol in Ameriya, Iraq, last November. (U.S. Army photo by SGT Martin K. Newton, 982nd Signal Co. (Combat Camera).)

The capabilities envisioned for JBC-P are coming soon to the Joint force. The evolution of FBCB2 to FBCB2-JCR and then to JBC-P is scheduled to correlate with the Army's Software Blocking (SWB) schedule. The current version of FBCB2 (V6.5) correlates with SWB 2. FBCB2-JCR will be fielded in conjunction with SWB 3 and JBC-P (Version 1) will be fielded in conjunction with SWB 4.

Since FBCB2's emergence onto the battlefield, commanders and leaders who have used it in combat recognized its significance and have used it to great effect. FBCB2 has provided unprecedented SA to all levels of command, and it has provided an enhanced means of enabling battle command for commanders and leaders. As FBCB2 evolves into FBCB2-JCR and later JBC-P, it will only improve, becoming more user-friendly and capable. With an increase in interoperable C2/SA systems' quantity, leaders and commanders will have a more accurate Joint battlefield picture. JBC-P will further improve situational understanding and decision making, and will assist Joint leaders by making it easier to mass both effects and forces at a critical point in an operation. Most importantly, JBC-P will help keep our Joint warfighters alive by increasing combat effectiveness and ensuring fratricide prevention.

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